

Docket No. 278810US2X PCT



MAILED 27 DEC 2005 PCT
IAP10 Rec'd PCT/PTO 27 DEC 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Kazushi YAMANAKA, et al.

SERIAL NO: 10/550,737

GAU:

FILED: September 26, 2005

EXAMINER:

FOR: SENSOR HEAD, GAS SENSOR AND SENSOR UNIT

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☒ The applicant(s) wish to make of record the references listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☐ Attached is a list of applicant's pending application(s), published application(s) or issued patent(s) which may be related to the present application. In accordance with the waiver of 37 CFR 1.98 dated September 21, 2004, copies of the cited pending applications are not provided. Cited published and/or issued patents, if any, are listed on the attached PTO form 1449.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION

- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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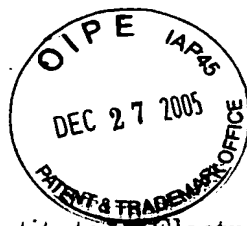
Registration No. 34,423



U.S. PCT Application Serial No.: 10/550,737
Docket No.: 278810US2XPCT

STATEMENT OF RELEVANCY

- 1) References _____ have been cited in the International Search Report. Copies of these references are being submitted herewith only when not automatically provided by the International Searching Authority.
- 2) References _____ have been cited in the corresponding _____ Search Report. A copy of these references is being submitted herewith.
- 3) Reference AW is discussed in the specification. A copy of these references is being submitted here with.
- 4) References _____ are additional prior art known to Applicant. A copy of these references is being submitted herewith.



Technical Report of Institute of Electronics, Information and Communication Engineers, Vol. US 2000, pp. 49-56

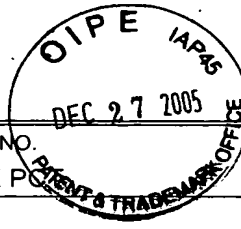
THE CONCISE EXPLANATION OF RELEVANCE

By analyzing propagation of surface acoustic waves (SAWs) generated by arcs on a sphere, the authors (a study group including K. Yamanaka) found that a SAW generated by a short arc diverges due to the diffraction, but SAWs generated by long arcs are collimated or focused, and they are confined within a finite band along the sphere so as to achieve multiple roundtrips. To prove and apply this phenomena, the authors generated 30 MHz SAW by phase velocity scanning of laser fringes, and observed quite large number (20) of roundtrips on 8mm diameter steel bearing ball. Because of the long propagation distance up to 50 cm due to the absence of diffraction, the authors achieved precise SAW velocity measurement with relative error less than 0.002%.

As shown in Table 1 on page 52, approximate relationships between wavenumber parameters, each of which is defined by the ratio of the circumference of the sphere and the surface acoustic wave wavelength (or product of the surface acoustic wave wavenumber and the sphere radius) and collimation angles, each of which is defined by the ratio of the orbital band width and the sphere radius are calculated.

Wavenumber Parameter $m=kr$ ((length of circumference of sphere) / (SAW wavelength))	Collimation Angle θ_{col} (degree)	(length of circumference of sphere)/(length of acoustic wave source)
150	15	24
300	9	40
450	8	45
600	7	51.4
750	6	60

Table 1. Relationships between wavenumber parameters and collimation angles (approximate values obtained by numerical calculation)

Form PTO 1449
(Modified)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTY DOCKET NO.

278810US2X P

SERIAL NO.

10/550,737

LIST OF REFERENCES CITED BY APPLICANT

APPLICANT

Kazushi YAMANAKA, et al.

FILING DATE

September 26, 2005

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						
	AL						
	AM						
	AN						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AO					
	AP					
	AQ					
	AR					
	AS					
	AT					
	AU					
	AV					

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)

	AW	Kazushi YAMANAKA et al., "Surface acoustic waves on a sphere", TECHNICAL REPORT OF INSTITUTE OF ELECTRONICS, INFORMATION AND COMMUNICATION ENGINEERS, vol. US 2000, pages 49-56 2000 (with English abstract)				
	AX					
	AY					
	AZ					<input type="checkbox"/> Additional References sheet(s) attached

Examiner

Date Considered

*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.